

CLAIMS

What is claimed is:

1. A fracture prediction device for a spot welded portion, comprising:

an input means inputting all or any of a material strength, a plate thickness, a nugget diameter of a spot welding, a plate width of a joint, and a rotation angle of the joint plates in a tension test, based on a cross tension test and/or a shear tension test at a spot welded joint;

a calculation means calculating a fracture strength parameter of the spot welded portion in a cross tension and/or a shear tension from all or any of the material strength, the plate thickness, the nugget diameter of the spot welding, the plate width of the joint, and the rotation angle of the joint in the tension test;

a parameter storage means storing the fracture strength parameter by each steel type; and

a calculation means judging a fracture of the spot welded portion by installing the fracture strength parameter stored in said parameter storage means into a fracture prediction formula in which a deformation at a periphery of the spot welding is modeled by a finite element method.

2. A fracture prediction device for a spot welded portion, comprising:

an input means inputting all or any of a material strength, a plate thickness, a nugget diameter of a

spot welding, a plate width of a joint, and a rotation angle of the joint in a tension test, based on a cross tension test and/or a shear tension test at a spot welded joint;

a calculation means calculating a fracture strength parameter in a cross tension and/or a shear tension based on a fracture strength curve of a spot welded portion asked from all or any of the material strength, the plate thickness, the nugget diameter of the spot welding, the plate width of the joint, and the rotation angle of the joint in the tension test;

a parameter storage means storing the fracture strength parameter by each steel type; and

a calculation means judging a fracture of the spot welded portion by installing the fracture strength parameter stored in said parameter storage means into a fracture limit line in which a deformation at a periphery of the spot welding is modeled by a finite element method.

3. A fracture prediction method for a spot welded portion, comprising the steps of:

inputting all or any of a material strength, a plate thickness, a nugget diameter of a spot welding, a plate width of a joint, and a rotation angle of the joint in a tension test, based on a cross tension test and/or a shear tension test at a spot welded joint;

calculating a fracture strength parameter of the spot welded portion in a cross tension and/or a shear

tension from all or any of the material strength, the plate thickness, the nugget diameter of the spot welding, the plate width of the joint, and the rotation angle of the joint in the tension test;

storing the fracture strength parameter by each steel type in a parameter storage means; and

judging a fracture of the spot welded portion by installing the fracture strength parameter stored in the parameter storage means into a fracture prediction formula in which a deformation at a periphery of the spot welding is modeled by a finite element method.

4. A fracture prediction method for a spot welded portion, comprising the steps of:

inputting all or any of a material strength, a plate thickness, a nugget diameter of a spot welding, a plate width of a joint, and a rotation angle of the joint in a tension test, based on a cross tension test and/or a shear tension test at a spot welded joint;

calculating a fracture strength parameter in a cross tension and/or a shear tension based on a fracture strength curve of a spot welded portion asked from all or any of the material strength, the plate thickness, the nugget diameter of the spot welding, the plate width of the joint, and the rotation angle of the joint in the tension test;

storing the fracture strength parameter by each steel type in a parameter storage means; and

judging a fracture of the spot welded portion by installing the fracture strength parameter stored in the parameter storage means into a fracture limit line in which a deformation at a periphery of the spot welding is modeled by a finite element method.

5. A computer program for a fracture prediction of a spot welded portion for designing circuit comprising:

program code means for calculating a fracture strength parameter of the spot welded portion in a cross tension and/or a shear tension from all or any of a material strength, a plate thickness, a nugget diameter of a spot welding, a plate width of a joint, and a rotation angle of the joint in a tension test inputted based on a cross tension test and/or a shear tension test at a spot welded joint;

program code means for storing the fracture strength parameter by each steel type in a parameter storage means; and

program code means for judging a fracture of the spot welded portion by installing the fracture strength parameter stored in the parameter storage means into a fracture prediction formula in which a deformation at a periphery of the spot welding is modeled by a finite element method.

6. A computer program for a fracture prediction of a spot welded portion for designing circuit comprising:

program code means for calculating a fracture

strength parameter of the spot welded portion in a cross tension and/or a shear tension based on a fracture strength curve of the spot welded portion asked from all or any of a material strength, a plate thickness, a nugget diameter of a spot welding, a plate width of a joint, and a rotation angle of the joint in a tension test inputted based on a cross tension test and/or a shear tension test at a spot welded joint;

program code means for storing the fracture strength parameter by each steel type in a parameter storage means; and

program code means for judging a fracture of the spot welded portion by installing the fracture strength parameter stored in the parameter storage means into a fracture limit line in which a deformation at a periphery of the spot welding is modeled by a finite element method.

7. A computer readable recording medium recording a computer program for causing a computer to execute the steps, comprising:

calculating a fracture strength parameter of a spot welded portion in a cross tension and/or a shear tension from all or any of a material strength, a plate thickness, a nugget diameter of a spot welding, a plate width of a joint, and a rotation angle of the joint in a tension test inputted based on a cross tension test and/or a shear tension test at a spot welded joint;

storing the fracture strength parameter by each steel type in a parameter storage means; and

judging a fracture of the spot welded portion by installing the fracture strength parameter stored in the parameter storage means into a fracture prediction formula in which a deformation at a periphery of the spot welding is modeled by a finite element method.

8. A computer readable recording medium recording a computer program for causing a computer to execute the steps, comprising:

calculating a fracture strength parameter of a spot welded portion in a cross tension and/or a shear tension based on a fracture strength curve of the spot welded portion asked from all or any of a material strength, a plate thickness, a nugget diameter of a spot welding, a plate width of a joint, and a rotation angle of the joint in a tension test inputted based on a cross tension test and/or a shear tension test at a spot welded joint;

storing the fracture strength parameter by each steel type in a parameter storage means; and

judging a fracture of the spot welded portion by installing the fracture strength parameter stored in the parameter storage means into a fracture limit line in which a deformation at a periphery of the spot welding is modeled by a finite element method.